FIG. 1

Blakely, Sokoloff, Taylor & Zafman LLP   (310) 207-3800
Title: TWO-DIMENSIONAL PYRAMID FILTER ARCHITECTURE
1st Named Inventor: Tinku Acharya
Express Mail No.: EV 339911332US   Docket No.:
42P11474C
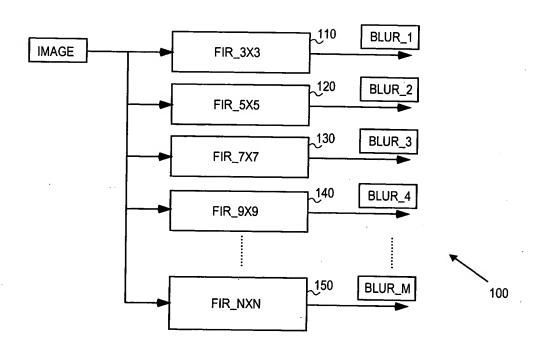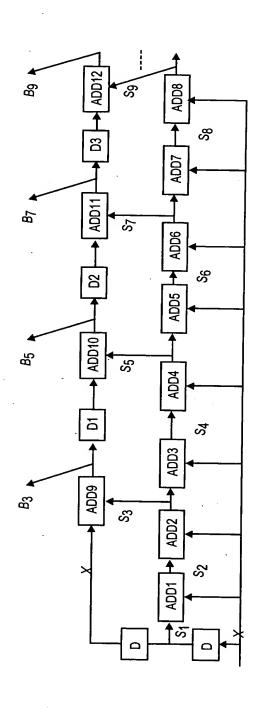Sheet: 2 of 9

FIG. 2

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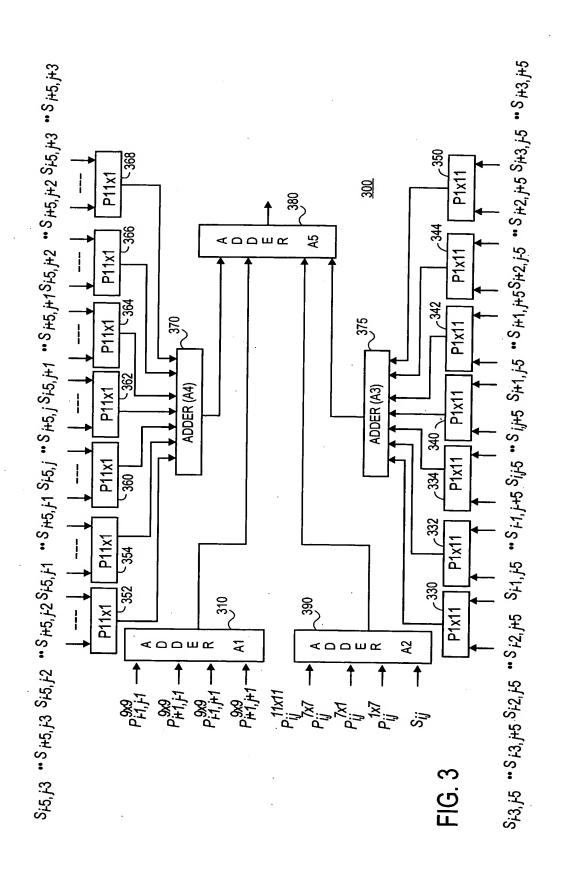Express Mail No.: EV 339911332US   Docket No.:
42P11474C
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FIG. 3

$$
P^{kxk} = \begin{bmatrix}
P_{0,0}^{kxk} & P_{0,1}^{kxk} & \cdot & \cdots & \cdot & \cdot & P_{0,N-1}^{kxk} \\
P_{1,0}^{kxk} & P_{1,1}^{kxk} & \cdot & \cdot & \cdot & \cdot & P_{1,N-1}^{kxk} \\
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
\cdots & \cdot & \cdot & P_{i,j}^{kxk} & \cdot & \cdot & \cdots \\
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
P_{M-1,0}^{kxk} & P_{M-1,1}^{kxk} & \cdot & \cdots & \cdot & \cdot & P_{M-1,N-1}^{kxk}
\end{bmatrix}
$$

FIG. 4

$$
S = \begin{bmatrix}
S_{0,0} & S_{0,1} & \cdots & S_{i-1,j-1} & S_{i-1,j} & S_{i-1,j+1} & \cdots & S_{0,N-1} \\
S_{1,0} & & & S_{i,j-1} & S_{i,j} & S_{i,j+1} & & S_{1,N-1} \\
\cdots & & & S_{i+1,j-1} & S_{i+1,j} & S_{i+1,j+1} & & \cdots \\
S_{M-1,0} & S_{M-1,1} & & & & & & S_{M-1,N-1}
\end{bmatrix}
$$

FIG. 5

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$$F_{kxk} = \begin{bmatrix} 1 \\ 2 \\ 3 \\ \vdots \\ \dfrac{k+1}{2} \\ \vdots \\ 3 \\ 2 \\ 1 \end{bmatrix} * \begin{bmatrix} 1 & 2 & 3 & \cdots & \dfrac{k+1}{2} & 4 & 3 & 2 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 2 & 3 & \cdots & \dfrac{k+1}{2} & \cdots & 3 & 2 & 1 \\ 2 & 4 & 6 & \cdots & \dfrac{2(k+1)}{2} & \cdots & 6 & 4 & 2 \\ 3 & 6 & 9 & \cdots & \dfrac{3(k+1)}{2} & \cdots & 9 & 6 & 3 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ \dfrac{k+1}{2} & \dfrac{2(k+1)}{2} & \dfrac{3(k+1)}{2} & \cdots & \dfrac{(k+1)*(k+1)}{4} & \cdots & \dfrac{3(k+1)}{2} & \dfrac{2(k+1)}{2} & \dfrac{k+1}{2} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 3 & 6 & 9 & \cdots & \dfrac{3(k+1)}{2} & \cdots & 9 & 6 & 3 \\ 2 & 4 & 6 & \cdots & \dfrac{2(k+1)}{2} & \cdots & 6 & 4 & 2 \\ 1 & 2 & 3 & \cdots & \dfrac{k+1}{2} & \cdots & 3 & 2 & 1 \end{bmatrix}$$

FIG. 6

$$
F_{11x11} = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 5 \\ 4 \\ 3 \\ 2 \\ 1 \end{bmatrix} * [1\ 2\ 3\ 4\ 5\ 6\ 5\ 4\ 3\ 2\ 1] =
$$

$$
\begin{bmatrix}
1 & 2 & 3 & 4 & 5 & 6 & 5 & 4 & 3 & 2 & 1 \\
2 & 4 & 6 & 8 & 10 & 12 & 10 & 8 & 6 & 4 & 2 \\
3 & 6 & 9 & 12 & 15 & 18 & 15 & 12 & 9 & 6 & 3 \\
4 & 8 & 12 & 16 & 20 & 24 & 20 & 16 & 12 & 8 & 4 \\
5 & 10 & 15 & 20 & 25 & 30 & 25 & 20 & 15 & 10 & 5 \\
6 & 12 & 18 & 24 & 30 & 36 & 30 & 24 & 18 & 12 & 6 \\
5 & 10 & 15 & 20 & 25 & 30 & 25 & 20 & 15 & 10 & 5 \\
4 & 8 & 12 & 16 & 20 & 24 & 20 & 16 & 12 & 8 & 4 \\
3 & 6 & 9 & 12 & 15 & 18 & 15 & 12 & 9 & 6 & 3 \\
2 & 4 & 6 & 8 & 10 & 12 & 10 & 8 & 6 & 4 & 2 \\
1 & 2 & 3 & 4 & 5 & 6 & 5 & 4 & 3 & 2 & 1
\end{bmatrix}
$$

FIG. 7

$$P^{1xk} = \begin{bmatrix} P_{0,0}^{1xk} & P_{0,1}^{1xk} & \cdots & & & P_{0,N-1}^{1xk} \\ P_{1,0}^{1xk} & P_{1,1}^{1xk} & & & & P_{1,N-1}^{1xk} \\ \cdots & & & & & \cdots \\ & & & P_{i,j}^{1xk} & & \cdots \\ & & & & & \\ P_{M-1,0}^{1xk} & P_{M-1,1}^{1xk} & & & & P_{M-1,N-1}^{1xk} \end{bmatrix}$$

FIG. 8

$$P^{kx1} = \begin{bmatrix} P_{0,0}^{kx1} & P_{0,1}^{kx1} & \cdots & & & & P_{0,N-1}^{kx1} \\ P_{1,0}^{kx1} & P_{1,1}^{kx1} & \cdots & & & & P_{1,N-1}^{kx1} \\ \vdots & & & & & & \vdots \\ & & & P_{i,j}^{kx1} & & & \\ \vdots & & & & & & \vdots \\ P_{M-1,0}^{kx1} & P_{M-1,1}^{kx1} & \cdots & & & & P_{M-1,N-1}^{kx1} \end{bmatrix}$$

FIG. 9